

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**



## (12) UK Patent Application (19) GB (11) 2 077 834 A

(21) Application No 8118434  
(22) Date of filing 16 Jun 1981

(30) Priority data

(31) 80/19737

(32) 17 Jun 1980

(33) United Kingdom (GB)

(43) Application published  
23 Dec 1981

(51) INT CL<sup>3</sup>  
E06B 3/66

(52) Domestic classification  
E1R 18B

(56) Documents cited  
GB 1541372  
GB 1505370  
GB 1273625

(58) Field of search  
E1R

(71) Applicants  
Leith Glazing Company  
Limited,  
93—98 Giles Street,  
Leith, Edinburgh EH6 6TP,  
Scotland

(72) Inventor  
James Arthur Albert  
Hickman

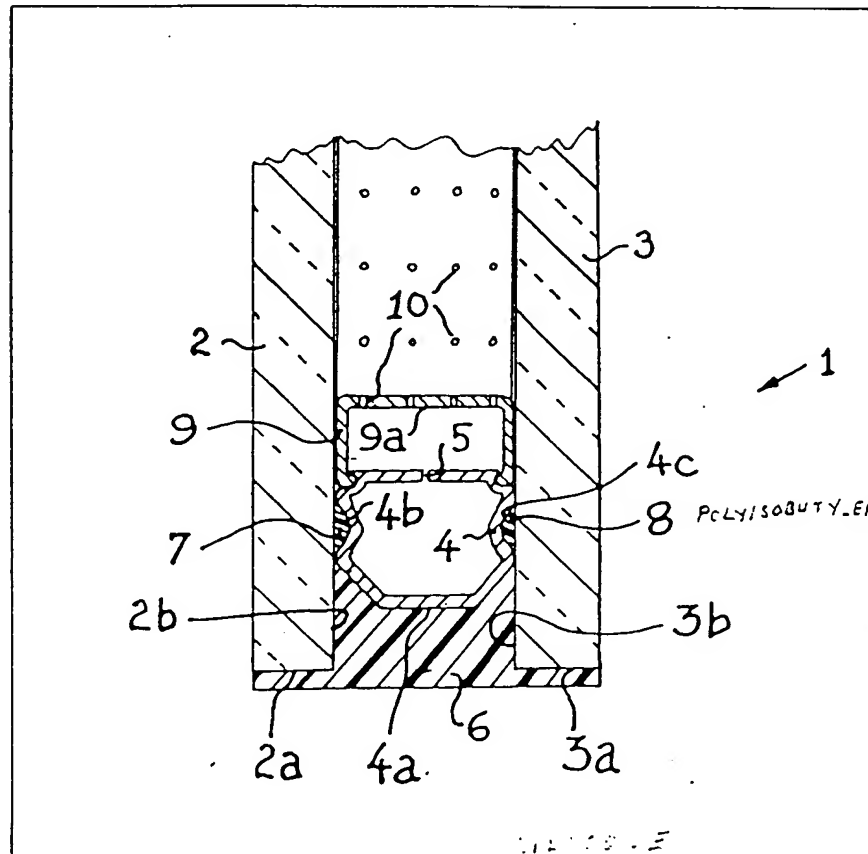
(74) Agents  
J. Y. & G. W. Johnson,  
Furnival House, 14—18  
High Holborn, London  
WC1V 6DE

(54) A multiple pane assembly

(57) A multiple pane assembly (1) comprises at least two transparent glazing sheets (2, 3) arranged face-to-face and separated by a spacer at their peripheries. The spacer comprises hollow metallic spacing members (4)

which are welded or soldered together at the corners of the pane assembly (1). An external seal (6) of silicone is adhered to the outside periphery of the spacer and the opposed inner surfaces of the glazing sheets (2, 3).

Preferably the external seal (6) extends around the rim of at least one of the glazing sheets (2, 3).

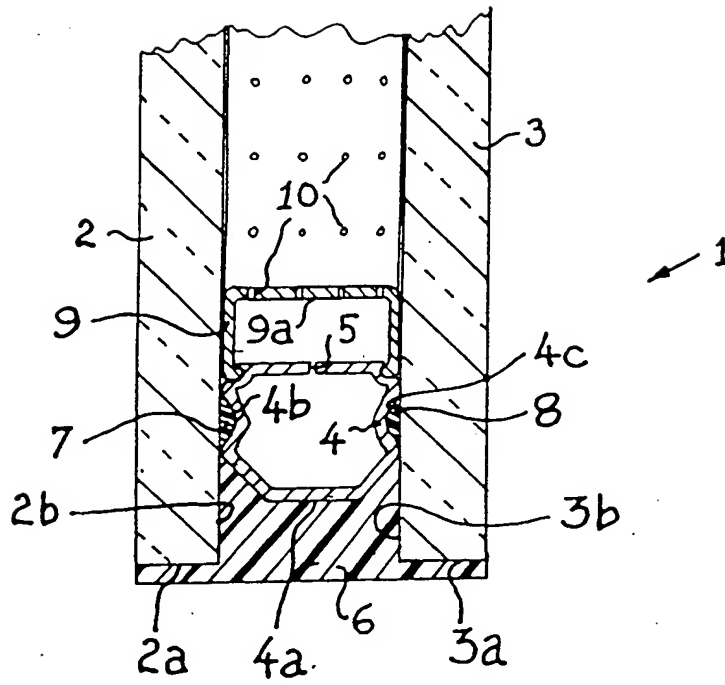


GB 2 077 834 A

**THIS PAGE BLANK (USPTO)**

2077834

1/1



**THIS PAGE BLANK (USPTO)**

## SPECIFICATION

## A multiple pane assembly

This invention relates to a multiple (i.e. two or more) pane assembly.

5 According to the invention a multiple pane assembly comprises at least two transparent glazing sheets arranged face-to-face and separated by a spacer adjacent the periphery of the glazing sheets to provide an air space between the sheets, the spacer comprising hollow metallic  
10 spacing members adjacent ones of which are welded or soldered together at corners of the pane assembly, and an external seal of silicone adhered to the outside periphery of the spacer and the  
15 opposed inner surfaces of the glazing sheets.

Suitably the external seal extends around the rim of at least one of said glazing sheets.

Conveniently the multiple pane assembly is provided with a pair of internal seals, typically of  
20 polyisobutylene, each internal seal being adhered to the inner surface of a respective one of the glazing sheets and a confronting side surface of each spacing member.

Suitably each hollow spacing member contains  
25 a desiccant and is provided with communicating means enabling the interior of each hollow spacing member to be placed in direct communication with the air space formed between the glazing sheets. The communicating  
30 means may be in the form of a continuous groove formed along the length of each spacing member or in the form of a plurality of spaced apart holes or openings formed along the length of each spacing member.

35 Conveniently adjacent spacing members are butt jointed, e.g. by means of a mitre joint, and are then inductively welded or flash welded together. Alternatively, the adjacent spacing members may be ultra-sonically soldered together.

40 An inner spacer, in the form of hollow, perforated elongate members, may be fixed to, so as to be positioned inwardly of, the first-mentioned spacer, the inner spacer serving to improve the noise insulating properties of the  
45 multiple pane assembly.

The invention will now be described, by way of example, with reference to the accompanying drawing the sole Figure of which shows a section through a multiple pane assembly according to the  
50 invention.

The Figure shows a multiple pane assembly in the form of a double glazed unit generally designated with the reference numeral 1. The unit 1 comprises a pair of rectangular, transparent  
55 glazing sheets 2, 3, e.g. of glass, arranged face-to-face and separated by four hollow metallic, e.g. extruded aluminium, spacing members (only one of which can be seen in the Figure) extending along respective sides of the unit 1. Adjacent spacing  
60 members 4 are welded together at each corner of the unit to provide a rigid hollow spacer extending continuously adjacent the periphery of the unit 1. Each spacing member 4 typically contains a desiccant and may be provided with a continuous

65 groove 5 along its length enabling the hollow interior of the member 4 to communicate directly with the air space formed between the separated sheets 2 and 3. Alternatively the groove 5 may be replaced by a plurality of spaced apart holes or openings (not shown). Conveniently the opposite  
5 ends of each spacing member 4 are mitred so that adjacent ends of each adjacent pair of members 4 are butted together to form a mitred joint, the adjacent ends then being inductively welded or  
10 flash welded together.

The unit 1 further comprises an external seal  
6 of silicone and a pair of inner seals 7 and 8 typically made of polyisobutylene. The external seal 6 is adhered to an outer peripheral surface 4a  
15 of each member and to the rim 2a (3a) and inner surface 2b (3b) of each glazing sheet 2 (3). The seal 6 which covers the rims 2a and 3a of the sheets 2 and 3, thus protects the peripheral edge of the glazing unit 1 during transportation and  
20 fitting of the unit 1. The inner seal 7 (8) is disposed inwardly of the seal 6 and is adhered to the inner surface 2b (3b) of the glazing sheet 2 (3) and to a confronting side surface 4b (4c) of each member 4. As can be seen in the Figure, each  
25 sealing member 4 is shaped so as to separate each of the seals 7 and 8 from the seal 6.

In order to improve the noise insulating properties of the unit 1, the latter may be provided with channel-shaped inner spacers 9 which are  
30 fixed, e.g. by means of a snap fitting, to the spacing members 4 so as to be positioned inwardly thereof. The base 9a of each channel-shaped member 9 is provided with a plurality of perforations 10.

35 In an alternative embodiment of pane assembly, adjacent spacing members 4 may be soldered, e.g. ultrasonically soldered, together at the corners of the unit 1 instead of being welded together.

40 Although a double glazed unit has been described in detail, it should be realised that the present invention is intended to cover other types of glazing units, e.g. three or four panel assemblies or units.

## CLAIMS

1. A multiple pane assembly comprising at least two transparent glazing sheets arranged face-to-face and separated by a spacer adjacent the preiphery of the glazing sheets to provide an air  
50 space between the sheets, the spacer comprising hollow metallic spacing members adjacent ones of which are welded or soldered together at corners of the pane assembly, and an external seal of silicone adhered to the outside periphery of the spacer and the opposed inner surfaces of the  
55 glazing sheet.

2. A multiple pane assembly according to claim 1, in which the external seal extends around the rim of at least one of said glazing sheets.

60 3. A multiple pane assembly according to claim 1 or 2, provided with a pair of internal seals, each internal seal being adhered to the inner surface of a respective one of the glazing sheets and

confronting side surfaces of the spacing members.

4. A multiple pane assembly according to claim 3, in which each internal seal is made of polyisobutylene.

5 5. A multiple pane assembly according to any of the preceding claims, in which each hollow spacing member contains a desiccant and is provided with communicating means enabling the interior of each hollow spacing member to be placed in direct communication with the air space between the glazing sheets.

10 6. A multiple pane assembly according to claim 5, in which the communicating means is in the form of a continuous groove formed along the length of each spacing member.

15 7. A multiple pane assembly according to claim 5, in which the communicating means is in the form of a plurality of spaced apart holes or openings formed along the length of each spacing member.

20 8. A multiple pane assembly according to any of the preceding claims, in which adjacent spacing members are butt jointed prior to being welded or

soldered together.

25 9. A multiple pane assembly according to claim 8, in which adjacent spacing members are butt jointed by means of a mitre joint.

30 10. A multiple pane assembly according to any of the preceding claims, in which adjacent spacing members are inductively welded or flash welded together.

11. A multiple pane assembly according to any of claims 1 to 9, in which adjacent spacing members are ultra-sonically soldered together.

35 12. A multiple pane assembly according to any of the preceding claims, comprising an inner spacer, in the form of hollow, perforated elongate members, is fixed to, so as to be positioned inwardly of, the first-mentioned spacer, the inner spacer serving to improve the noise insulating properties of the multiple pane assembly.

40 13. A multiple pane assembly constructed and arranged substantially as herein described with reference to, and as illustrated in, the accompanying drawing.